Name: Date:

Polynomial Factoring solution (version 648)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 13 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 52}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-48}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{3}\, i}{2}$$

$$x = -1 \pm 2\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 - 4i$ and $5 + 6i$ in standard form ($a + bi$).**

Solution

$$(3 - 4i) \cdot (5 + 6i)$$

$$15 + 18i - 20i - 24i^2$$

$$15 + 18i - 20i + 24$$

$$15 + 24 + 18i - 20i$$

$$39 - 2i$$

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3. **Write function $f(x) = x^3 + 4x^2 - 11x - 30$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	4	-11	-30
3		3	21	30
	1	7	10	0

$$f(x) = (x-3)(x^2+7x+10)$$

$$f(x) = (x-3)(x+5)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)\cdot(x+2)\cdot(x-3)^2$$

Sketch a graph of polynomial $y = p(x)$.